

STATUS OF THE CLAIMS

Claims 1-22 were originally filed in this patent application. In response to the office action dated 03/29/2006, a Request for Reconsideration was filed on 06/29/2006 that included a declaration under 37 C.F.R. 1.132 to remove the Luick reference as prior art. In response to the office action dated 09/14/2006, an RCE and amendment was filed on 09/27/2006. In the pending office action, the Examiner maintained the rejections of the previous office action. Claims 1-2 and 9-13 were rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,348,671 to Doing *et al.* (hereinafter “Doing”) in view of U.S. Patent No. 5,933,627 to Parady and claims 3-6, 8, 14-19, 21 and 22 were rejected under 35 U.S.C. §103(a) as being unpatentable over Doing in view of Parady and further in view of U.S. Patent Application Publication No. 2003/0135711 to Shoemaker *et al.* (hereinafter “Shoemaker”). Claims 7 and 20 were rejected under 35 U.S.C. §103(a) as being unpatentable over Doing in view of Parady, Shoemaker and U.S. Patent No. 6,314,511 to Levy *et al.* (hereinafter “Levy”). Claims 7 and 20 were also rejected under 35 U.S.C. §103(a) as being unpatentable over Doing in view Parady and Shoemaker. No claim was allowed. No claims have been amended herein. Claims 1-22 are currently pending.

REMARKS

Rejection of claims 1-2 and 9-13 under 35 U.S.C. §103(a)

The Examiner rejected claims 1-2 and 9-13 under 35 U.S.C. §103(b) as being unpatentable over Doing in view of Parady. Applicant asserts the cited art does not teach or suggest the claimed invention.

Claim 1

For the claim limitation “swaps instructions stored in the first instruction buffer with instructions stored in the second instruction buffer”, the Examiner cites Parady (col. 5, lines 38-43 and Fig. 7). In the alternative embodiment shown in Figures 6 and 7, there are shadow registers in the register file that is associated with the integer execution unit. With reference to the register file 184 and the shadow register files 186, Parady teaches the “data switch 192 can be used to route data to and from the shadow registers” (col. 5, lines 40-41, emphasis added). Parady further teaches in the preceding paragraph that “it may be more economical to swap the thread data in and out of the four, single or dual-ported shadow register files” (col. 5, lines 32-34). Thus the sections of Parady that the Examiner has relied on for teaching to swap instructions actually teaches to swap data.

In the most recent office action, the Examiner argues that it is obvious to incorporate the swapping of state data from the shadow registers as taught in Parady with the instruction buffers in Doing to exchange “not just various context information but instructions themselves during a thread switch” (page 4, lines 4-5). Support for this conclusion draws on the recent Supreme Court case of *KSR v. Teleflex*, 550 U.S. ____ (2007), where the Supreme Court stated:

“When there is a design need or market pressure to solve a problem and there are a finite number of identified, predictable solutions, a person of ordinary skill has good reason to pursue the known options within his or her technical grasp. If this leads to the anticipated success, it is likely the product not of innovation but of ordinary skill and common sense.”

In applying the Supreme Court’s teaching above, the Examiner noted that there are primarily two options available to one of ordinary skill in the art. The second option noted by the Examiner is the combination of Parady and Doing set forth by the Examiner. This is simply not how the Supreme Court applied this rationale in KSR. In the Supreme Courts words, there was “good reason to pursue **known options**”, (emphasis added). In KSR v. Teleflex, the patent that was found to be obvious combined the known option of a sensor on a gas pedal, with the known option of an adjustable gas petal with a fixed pivot. So in KSR, the combined elements of the prior art were both known to be options of a gas pedal. In this case, the second option the Examiner identifies was not known. The second option is a combination of the prior art that the Examiner only concludes would have been known. In fact, the Examiner’s reasoning looks more like hindsight, where the Examiner uses the Applicant’s application as a blueprint to supply the “known option” for the KSR analysis from a combination of the prior art. The Examiner has applied the KSR analysis beyond the manner described by the Supreme Court.

The Supreme Court in KSR further cited *Sakraida v. AG Pro, Inc.*, 425 U. S. 273 (1976), where the Court derived from the precedents the conclusion that when a patent simply arranges old elements with each performing the same function it had been known to perform, and yields no more than one would expect from such an arrangement, the combination is obvious. *Id.*, at 282. In the present case, when the shadow registers of Parady are combined with Doing in the Examiner’s combination, they do not perform the same function, in the same way, to produce a similar result as taught in the prior art. The swapping of data in the shadow registers taught by Parady does not perform the same

function as the corresponding structure in the claimed invention and does not yield the same results. Swapping data in shadow registers is not the same function as performed by the thread switch mechanism. The thread switch mechanism detects when the primary thread stalls, and in response thereto, swaps instructions stored in the first instruction buffer with instructions stored in the second instruction buffer. The shadow registers do not swap instructions so they are operating in a different way to produce a different result. Parady does not teach or suggest the invention as argued by the Examiner. The combined art does not perform the same function in the same way to provide a similar result. The Examiner has failed to establish a *prima facie* case. Reconsideration is respectfully requested.

The Examiner's argument states the motivation to combine, or the "good reason" is the advantage shown in Parady of saving cost by using less silicon for read ports. This motivation or good reason to combine does not relate to the invention herein. There are no read ports in the combination that are being reduced to realize the cost savings. The motivation to combine must motivate one of ordinary skill in the art to combine the art in the manner claimed. The Examiner has not shown a proper and relevant motivation to combine the cited art in the manner claimed. The Examiner has failed to establish a *prima facie* case. Reconsideration is respectfully requested.

Claim 2

Claim 2 depends on claim 1, which is allowable for the reasons given above. Claim 2 is therefore allowable as depending on an allowable independent claim.

Claim 9

In the rejection of claim 9, the Examiner cites column 7, line 52 to column 8, line 3 of Doing for the claim limitation of swapping information stored in the first instruction

buffer with information stored in the second instruction buffer. The cited section of Doing describes changing the active thread. While it is evident that Doing does swap the contents of some registers that are associated with the thread buffer, the contents of the thread buffer are not swapped. The express teachings of Doing indicate the contents of the sequential hold buffer and the thread switch buffer are not swapped. In Doing, when there is a thread switch, the inactive thread becomes the active thread, and the active thread becomes the inactive thread as taught on column 14, lines 22 through 24. When a thread is switched from inactive to active, there is no swapping or moving of instructions between the sequential hold buffer and the thread switch buffer. To the contrary, the decode/dispatch logic 206 simply chooses a different buffer as the source of the next instruction.

In contrast to Doing, the claims clearly distinguish that the information that is swapped in the instruction buffers comprises instructions. As described above with reference to claim 1, Parady also does not teach or suggest swapping the instructions. Doing and Parady do not teach or suggest to swap the instructions in the instruction buffers as claimed herein. The Examiner is respectfully requested to withdraw the rejection of claim 9.

Claims 10-13

Claims 10-13 depend on claim 9, which is allowable for the reasons given above. Claims 10-13 are therefore allowable as depending on an allowable independent claim.

Rejection of claims 3-6, 8, 14-19, 21 and 22 under 35 U.S.C. §103(a)

The Examiner rejected claims 3-6, 8, 14-19, 21 and 22 under 35 U.S.C. §103 as being unpatentable over Doing in view of Parady and further in view of Shoemaker. Applicants assert the cited art does not teach or suggest the invention as claimed.

Claims 3-6

Claims 3-6 depend on claim 1, which is allowable for the reasons given above. Claim 3-6 are therefore allowable as depending on an allowable independent claim. The Examiner adds the Shoemaker reference for the concept of multiple threads (more than 2). The arguments for claim 1 are included here by reference. In Shoemaker, the multiple threads are threads that are all available to be selected (paragraph 6). These multiple threads could be considered as stated by the Examiner, simply replicated portions of Doing. However, the claimed invention is not simply replicated portions of Doing. In the invention of claim 3, the primary threads swap instructions with secondary threads when there is a stall. The cited art does not teach or suggest swapping instructions for threads from a secondary thread to a primary thread. Reconsideration is respectfully requested.

Claim 8

Claim 8 was previously amended to add the limitation that the instructions from the backup instruction buffer are swapped with instructions in the primary register. This limitation is similar to the limitations discussed above for claim 1 and those arguments are incorporated here. Reconsideration is respectfully requested.

Claims 14-17

Claims 14-17 depend on claim 9, which is allowable for the reasons given above. Further, claims 14-17 include the limitations discussed with reference to claims 3-6 discussed above and those arguments are included here. Claims 14-17 are therefore allowable as depending on an allowable independent claim and for the reasons stated above. Reconsideration is respectfully requested.

Claim 18

Claim 18 includes the limitations discussed with reference to claims 3-6 and those arguments are included here. Claim 18 is therefore allowable for the reasons stated above. Reconsideration is respectfully requested.

Claim 19

Claim 19 depends on claim 18, which is allowable for the reasons given above. Claim 19 is therefore allowable as depending on an allowable independent claim.

Rejection of claims 7 and 20 under 35 U.S.C. §103(a)

The Examiner rejected claims 7 and 20 under 35 U.S.C. §103 as being unpatentable over Doing in view of Parady in view of Shoemaker and further in view of Levy. Applicants assert the cited art does not teach or suggest the claimed invention as amended herein. Claims 7 and 20 depend on claims 5 and 18 respectively, which are allowable for the reasons given above. Therefore claims 7 and 20 are allowable as depending on an allowable claim. For the claim limitation of “a pool of backup registers,” the Examiner cites Levy’s use of a pool of registers to be used for register

renaming during a context switch. Again, the structure in the cited art does not teach or suggest to use a pool of registers in the manner claimed. While there is a pool of registers in Levy, they do not provide the same function in the same way to provide a similar result. The pool of registers in Levy is not used to hold instructions. They do not function in a similar way to allow swapping of an instruction stream to provide continued operation when there is stalled thread.

The Examiner's motivation to combine in this rejection suffers from the same problem discussed above. The motivation is directed to a structure in the prior art and does not motivate one of ordinary skill in the art to combine the art in the manner claimed. Reconsideration is respectfully requested.

Rejection of claims 7 and 20 under 35 U.S.C. §103(a)

The Examiner rejected claims 7 and 20 under 35 U.S.C. §103 as being unpatentable over Doing in view of Shoemaker and further in view of Parady. Claims 7 and 20 depend on claims 5 and 18 respectively, which are allowable for the reasons given above. Therefore claims 7 and 20 are allowable as depending on an allowable claim. Further, Applicants assert the cited art does not teach or suggest the claimed invention as amended herein. In this rejection, the Examiner relies on Parady to show the pool of registers as shown in Figure 7. This rejection is confusing since these same structures (shadow registers in Figure 7) were used in the rejection of the instruction buffers in the base claim (claim 5). This rejection also suffers from the same problems as discussed above. Reconsideration is respectfully requested.

Conclusion

In summary, none of the cited prior art, either alone or in combination, teach, support, or suggest the unique combination of features in applicants' claims presently on file. Therefore, applicants respectfully assert that all of applicants' claims are allowable. Such allowance at an early date is respectfully requested. The Examiner is invited to telephone the undersigned if this would in any way advance the prosecution of this case.

Respectfully submitted,

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